I have seen bricks so carelessly made with respect to the use of chalk, that on dropping one of them, it would break to pieces, and exhibit the chalk in large solid lumps; in such case, if the bricks should be saturated with water, after being passed through the clamp, they will heat, swell, and crack in all directions, in consequence of the chalk having been converted into caustic lime, by having its carbonic acid expelled when being fired in the clamp or kiln.

Bricks vary as much in colour as they do in quality, which is attributable to a number of causes, the two principal, however, are the natural quality of the component parts of the clay, and the mode in which the bricks are treated in the process of manufacture; some clay contains a very heavy trace of iron in different shapes, varying in colour from deep brown to light yellow, according to local circumstances; it is not unfrequently tinged of a greenish blue by the presence of the silicate of iron, which causes the clay to be mottled in its appearance in the pit. Great care is required in burning bricks to produce them of a good uniform pale yellow colour, which is the favourite of the London market, for if they are burnt too rapidly in contact with a free supply of atmospheric air, they are liable to be of a dingy red colour, alternating into a coarse dusky brown; whereas if they are carfully burned with but a moderate supply of air, say just enough to turn the iron into a peroxide, it will colour them of nearly a uniform sulphur yellow, which is the preferable colour according to present notions.

One great cause of the inferiority of bricks is the unwarrantable haste in which they are made; the field is now often bought, the earth prepared, and the bricks made ready for use in a few weeks; in fact, as many months are required to prepare the earth properly as we now take only weeks to make them complete. It is a very common matter now-a-days for a contractor to take a field near where his work lies, and make the bricks in the spring that are to be used in summer. The great falling off of the quality of modern bricks is a very probable cause of the decadence of the art of bricklaying, which has sunk from a high degree of perfection to its present miserable condition.

Where are we to look at this time for such brickwork as the builders of Wren's day produced? The highest ambition of a bricklayer is now to run a few arch-heads and window-crowns in "fine stuff," never daring to come into honourable rivalry with the glorious work—neat, clean, close, and smooth—of their worthy, plodding, but not to be beaten, great grandsires.

I will conclude these few words by repeating, that until our brick-makers give *more time and more labour* to the manufacture of their materials, it is hopeless to look either for good bricks or good brickwork.

JOSEPH LOCKWOOD.

EFFECT OF SEA-WATER ON CAST-IRON.

MR. FARADAY has addressed the following observations on this subject to Sir Byam Martin, chairman of the "Harbours of Refuge and Defence" commission:—

"Sir,—I hasten to reply to your note, though not, I fear, with any certain knowledge, for infirm health has prevented me from taking up the consideration of the action of sea-water on iron, as my observations will permit. I conclude that the question is of cast-iron in sea-water. Between these two bodies there is a vigorous action. As far as I have been able to observe, it is the greatest in the water near the surface; less in deep water, and least of all when the iron is buried in sand, or earth, or building materials (into which the water may penetrate); for then the oxide and other results formed are detained more or less, and form sometimes a cement to the surrounding matter, and always a partial protection. Soft cast-iron, as far as my experience goes (which is not much), corrodes more rapidly than hard cast; soft cast-iron, as far as my experience goes, more rapidly than the brittle white iron. As to the amount of corrosion in any given time, I have not had the opportunity of observing any good and satisfactory cases of illustration.

"In estuaries and the mouths of rivers it is very probable that great differences of corrosion will arise from the different circumstances of variable saltness; the soil of the river if near a town, the metallice, will much effect it; thus a wharf of cast-iron might occasionally be greatly injured by making fast to it vessels that are coppered using iron cables.

"As to the protection of iron, and first by a coating; the permanency of a coat of paint, or of tar, or bituminous matter, can only be ascertained by reference to experience. Of this I have none, except in a case where coated iron sheathed for vessels was brought to me. I was much impressed with the thorough adhesion of the coat to the iron. The process was patent, and I cannot remember whose it was. Zinced iron would no doubt resist the action of the sea-water as long as the surface was covered with zinc, or even when partially crusted with that metal; but zinc dissolves rapidly in sea-water, and, after it is gone, the iron would follow.

"As to voltaic protection, it has often struck me that the cast-iron piles proposed for light-houses, or beacons, might be protected by zinc, in the manner Davy proposed to protect copper by iron; but there is no doubt the corrosion of the zinc would be very rapid. If found not too expensive the object would be to apply the zinc protectors in a place where they could be examined often, and replace them when rendered ineffective. In this manner, I have little doubt that iron could be protected in sea-water. It is even probable that, by investigation and trial, different sorts of iron might easily be distinguished and prepared, one of which would protect the other; thus soft cast-iron would, probably, protect hard cast-iron, and then it would be easy to place the protecting masses where they could be removed when required.

"Hence, though iron be a body very subject to the action of sea-water, it does not seem unlikely that it might be used with advantage in marine constructions intended to be permanent, especially if the joint effects of preserving coats of voltaic protectors were applied. Perhaps engineers are in the possession of practical and experimental data sufficient to allow the formation of a safe judgment on this point. For my own part, I am not, and therefore am constrained to express the above opinions with much doubt and reserve."

ON FIXING CLOSE STOVES.

SIR,—In consequence of the numerous fires that constantly occur from the *careless* manner in which close stoves are generally fixed, I beg to offer the following remarks for insertion in your popular journal, with the hope that they may lead to some improvement.

Nearly all stoves of this kind, if not properly attended to, are dangerous from getting overheated, and consequently should be securely fixed away from any combustible material. If the stoves are placed detached in the open space of a room or workshop, the wood floors should be cut away, and trimmed to at least 12 inches in length all around the stove; an arch of brickwork should be turned under in cement and a piece of stone laid to a level with the floor, which, to the extent of 18 inches further, should be lined with lead, and the stove placed in an iron pan. If the horizontal pipe is carried into the chimney opening, the latter should be filled up with brickwork (or sheet-iron) with a trap-door, so that the soot may be removed, which frequently falls down; several fires have arisen from this cause alone. If the pipe is used for heating glue-pots, drying timber and other materials, the whole of the stove and pipe should be embraced by an iron fender, about 3 or 4 inches higher than both of them, or at least a trough of iron running the whole length of the pipe, leaving a space of 7 or 8 inches round the same. And they might in manufactories, workshops, &c., where appearance is not much considered, be placed on three or four courses of brickwork covered with a piece of stone, having an iron rim to form a fender round its edges; another method might be adopted, and perhaps the more convenient, leaving the chimney open, and having an elbow to the end of the horizontal pipe with a length of perpendicular pipe up the flue, which should be filled up just above the level of the mantel with brickwork or slate, having a trap, so that the chimney might be easily swept. With this arrangement, the stove might at any time be removed and a register grate be placed in the recess. When a stove is close to a chimney opening within the confines of the stone hearth, either of the above plans with regard to filling in the chimney opening may be employed, having a liberal quantity of sheet-lead spread on the floor round the same. Many flues are fixed with the horizontal pipes running through wood partitions, having holes cut just the size of the pipe; the pipe from want of cleaning, gets red-hot, and sets fire to the woodwork. It would be better in all such cases to take out the wood panel, and insert an iron one, which would prevent such accidents, and when painted to match, would make the whole complete in appearance. In no case should stoves or pipes be placed within less than 12 inches from any woodwork, unless it be lined with lead; and in confined places, running through cupboards, &c., there should be double pipes, leaving a space for a draft of air to pass freely between them. Lead is the best material to be employed, the cheapest, and most durable, and being pliable, may be easily dressed round mouldings and other projections, and when well nailed on the floors, is less likely than iron to be turned up by the traffic of the feet. It is of the utmost importance that all stoves should be safely fixed, not only for the security of the party setting them up, but that of his neighbours; a few pounds laid out in the first instance would produce a saving in the end, seeing how many fires arise from them, and that the insurance offices charge from 1s. to 5s. additional premium, according to the number and nature of the stoves. No extra charge is made when they are properly fixed and attended to.

I do not offer these suggestions as new, but as likely to prevent accidents by fire, and the infliction of high premiums by the insurance offices.

W. J. S.

[Schedule F annexed to the Buildings Act, contains the following clause:—

"*Close Fires.*—And as to every oven, furnace, cokel, or close fire used for the purpose of trade or manufacture, it must be 6 inches at the least distant from any party-wall, and must not be upon nor within a distance of 18 inches of any timber or wood-work. And the floor on or above which such oven, furnace, cokel, or close fire shall be built or fixed, must be formed and paved under, and for a distance of 2 feet all round the same, with stone, brick, tile, or slate, at the least 2 inches thick, or other proper incombustible and non-conducting materials." It likewise provides that no metal or other pipe or funnel for conveying smoke, heated air, or steam, shall be fixed on the inside of any building nearer than 14 inches to any timber or other combustible material. —ED.]

RAILWAY NEGLIGENCE.—At the Maidstone Assizes last week, two actions were brought against the South-Eastern Railway Company, to recover the value of certain stacks and farm buildings which were destroyed by fire, originating in sparks emitted from the chimney of a railway engine. Proof was adduced that means had been taken upon other lines of railway, by placing a wire guard over the top of the chimney of the engine, or by using a plate perforated with holes in front of the smoke-box, to prevent the burning coals or ashes issuing from it; but that upon this line these precautions had been altogether neglected. Verdicts were returned in both actions for the respective plaintiffs; in the first, the damages amounted to 800*l.*, in the other to 894*l.* 14*s.*

ATMOSPHERIC RAILWAY.—On the motion of Mr. Shaw, a committee has been appointed by the House of Commons, to inquire into the merits of the atmospheric system of railway propulsion. The right hon. member stated, that Sir John Rennie, Mr. Cubitt, and other eminent engineers were confident of its success; and the Messrs. Maudslay, of Westminster-road, were willing to contract for keeping the apparatus in repair at an expense of not more than 5 per cent. per annum, whereas the cost of repairing the ordinary locomotive engines was 50 per cent. per annum; and the first expense of the atmospheric railway was not greater per mile than that under the present system. Sir Robert Peel consented to the appointment of the committee.

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